

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES
IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Daniel W. Cushing et al.
Serial No.: 10/707, 612
Filed: 12/24/2003
For: Translucent, Flame Retardant Composite Materials
Art Unit: 1771
Examiner: Andrew T. Piziali
Attorney Docket No.: 03-1090

To: Attention: Board of Patent Appeals and Interferences
Commissioner for Patents
P. O. Box 1450
Alexandria, Virginia 22313-1450

Appellant's Brief (37 C.F.R. 41.37)(revised)

This Brief is in furtherance of the Notice of Appeal filed in this case on June 21, 2007 and the Notification of Non-Compliant Appeal Brief mailed October 23, 2007.

The Brief is being filed via EFS-Web. The fee required by this Brief was charged to Deposit Account Number 50-3195 via EFS-Web August 20, 2007.

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The Real Party in Interest (37 C.F.R. 41.37(c)(1)(i))

The real party in interest is THE BOEING COMPANY, the assignee of record.

Related Appeals and Interferences (37 C.F.R. 41.37 (c) (1) (ii))

There are no related appeals and interferences.

Status of Claims (37 C.F.R. 41.37 (c) (1) (iii))

Claims 1, 2, 4 and 5 were finally rejected by the Examiner in the office action dated March 9, 2007.

Claims 6-18 and 40 have been withdrawn from consideration.

All other claims (3, 19-39) have been canceled.

Among the claims currently under consideration, claim 1 is the sole independent claim. Claims 2, 4 and 5 directly or indirectly depend on claim 1.

No claims have been allowed.

The rejections of claims 1, 2, 4 and 5 are being appealed.

Status of Amendments (37 C.F.R. 41.37 (c) (1) (iv))

No amendment to the claims after final rejection was proffered. A response after final rejection was filed on April 30, 2007 and resulted in the Advisory Action dated May 8, 2007, in which the rejection of claims 1, 2, 4, and 5 under 35 U.S.C. 112 is withdrawn.

Summary of Claimed Subject Matter (37 C.F.R. 41.37 (c) (1) (v))

The subject matter defined in claim 1 is of a “two-layer composite material for use in translucent, flame-resistant components” (*see, e.g.*, Paragraphs 7-8, 16-18 and 20-24; and Figure 15). The composite of claim 1 comprises “a substantially continuous nonwoven thermoplastic polyphenylsulfone substrate” (*see* Paragraph 24) and “a plurality of long glass fibers” “laminated within said polyphenylsulfone substrate” (*see* Paragraphs 7, 27, 28 and 41) The long glass fibers have “a melting temperature above the melting temperature of the polyphenylsulfone” and are “selected from the group consisting of a plurality of long s-type glass fibers and a plurality of long e-type glass fibers” (*see* Paragraph 27). The “composite material has an average allowable heat release not exceeding a 65/65 standard and can be post processed by bending, cutting or thermoforming” (*see* Paragraphs 28 and 41).

Claim 2 recites a composite material of claim 1 wherein the long glass fibers are unidirectional, i.e., a preferred feature (*see* Paragraphs 7, 20, 22 and Figure 17).

Claim 4 recites a composite material of claim 1, used as a translucent, flame-resistant interior component for aircrafts (*see, e.g.*, Paragraphs 19, 23 and Figures 1-14).

Claim 5 is dependent on claim 4 and recites the various forms of using the composite material on an aircraft (*see, e.g.*, Paragraphs 19, 23 and Figures 1-14).

Ground of Rejection to Be Reviewed on Appeal (37 C.F.R. 41.37 (c) (1) (vi))

It is requested that following ground of rejection (35 U.S.C. 103(a)) set forth in the final office action dated March 9, 2007, is to be reviewed on appeal.

1. Claims 1, 2, 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Pat. Appl. Publ. 2004/0219855 to Tsotsis in view of USPN 5,319,003 to Gomez et al.

The other ground of rejection set forth in the same final office action, based on 35 U.S.C. 112, has been removed by the Examiner in the Advisory Action dated May 8, 2007 in view of the applicants' arguments dated April 30, 2007.

Arguments (37 C.F.R. 41.37 (c) (1) (vii))

1. Rejection of claims 1, 2, 4 and 5 under 35 U.S.C. 103(a) as being unpatentable over U.S. Pat. Appl. Publ. 2004/0219855 to Tsotsis in view of USPN 5,319,003 to Gomez et al.

Tsotsis is directed to composite materials and namely multiaxial fabrics comprising reinforcing layers of unidirectional fibers with nonwoven layers disposed between the reinforcing layers and melt-bonded to at least one of the reinforcing layers. The reinforcing layers are fabric layers and specifically fabric layers of unidirectional fabrics (see paragraph 0037 and Fig. 2, the latter is produced below).

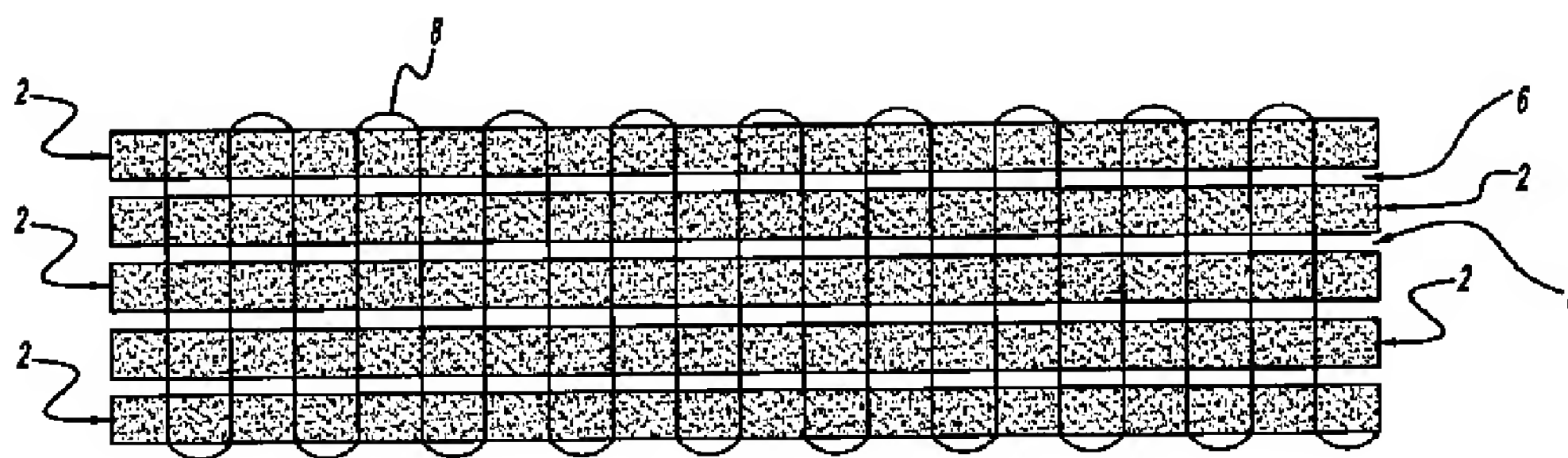


FIG - 2

In Fig. 4 and paragraph 0043, the process for making the preform is illustrated and the layup of unidirectional fabric layers is described. Clearly fabrics are involved. In contrast, nonwoven, non-fabric composites are disclosed and claimed in the present invention.

The distinction between nonwoven and fabrics is well established and well documented. Attention is called to the Complete Textile Glossary published by Celanese Acetate LLC (copies of pertinent pages enclosed) in which “fabric is defined as a planar textile structure produced by interlacing yarns, fibers or filaments” and nonwoven fabric

is defined as “An assembly of textile fibers held together by mechanical interlocking in a random web or mat, by fusing of the fibers (in the case of thermoplastic fibers), or by bonding with a cementing medium such as starch, glue, casein, rubber, latex, or one of the cellulose derivatives or synthetic resins. Initially, the fibers may be oriented in one direction or may be deposited in a random manner. This web or sheet of fibers is bonded together by one of the methods described above. Normally, crimped fibers that range in length from 0.75 to 4.5 inches are used. Nonwoven fabrics are used for expendable items such as hospitable sheets, napkins, diapers, wiping cloths, as the base material for coated fabrics, and in a variety of other applications. They can also be used for semi-disposable items and for permanent items such as interlinings.”

The Examiner has acknowledged that Tsotsis is silent with respect to specific glass fibers and relies on Gomez to provide this teaching. It is his opinion that it would have been obvious to one skilled in the art at the time the invention was made to make the glass fibers from s-type or e-type glass fibers as taught by Gomez motivated by the expectation of successfully practicing the invention of Tsotsis.

Gomez is directed to a process for making a composite article which comprises contacting at least one continuous filament with a mixture comprising a resin and a strain relieving polymer. The continuous filaments can be made of polyaramid fiber, graphite fiber, glass fiber, boron fiber and combinations thereof. The types of fibers are illustrated by examples (column 3) and glass fibers illustrated by E-type, S-type, A-type and C-type.

Gomez teaches a process for forming a reinforced resin composite by coating continuous filament with a thermosetting mixture of a resin and a strain relieving polymer. According to Gomez, the thermosetting mixture more specifically comprises “i)

a resin selected from the group consisting of unsaturated polyester resins, vinyl ester resins, and mixtures thereof; ii) a styrene monomer; and iii) a thermoplastic polymer (claim 1 of Gomez). It is the continuous filament which can be a glass fiber (more specifically identified at column 3, lines 28 et seq.) as recited by Gomez. The coated filaments are formed into the desired shape and the thermosetting mixture cured. The process and product are very different from those of Tsotsis and because of their nature would not suggest modifications to be made to the Tsotsis' highly porous interlays to toughen liquid molded fabric based composites.

Claim Appendix (37 C.F.R. 41.37 (c) (1) (viii))

A clean copy of the claims in the case is submitted herewith.

Claim 1. A two-layer composite material for use in translucent, flame-resistant components comprising:

a substantially continuous nonwoven thermoplastic polyphenylsulfone substrate;
and

a plurality of long glass fibers having a melting temperature above the melting temperature of said polyphenylsulfone and laminated within said polyphenylsulfone substrate, wherein said plurality of long glass fibers is selected from the group consisting of a plurality of long s-type glass fibers and a plurality of long e-type glass fibers, wherein said composite material has an average allowable heat release not exceeding a 65/65 standard and can be post processed by bending, cutting or thermoforming.

Claim 2. The two-layer composite material of claim 1, wherein said plurality of long glass fibers comprises a plurality of unidirectional long glass fibers.

Claim 4. The two-layer composite material of claim 1, wherein said translucent, flame-resistant components comprises an interior component contained within a commercial aircraft.

Claim 5. The two-layer composite material of claim 4, wherein said interior component is selected from the group consisting of a countertop, a cabinet enclosure, a tray table, a backlit lighted sign, an illuminating window panel, a window bezel, a class divider, a privacy partition, a backlit ceiling panel, a direct lighting ceiling panel, a backlit control panel, a lighted door, a lighted door latch, a doorway lining, a proximity light, a stow bin door, a privacy curtain, a translucent door handle, a translucent amenities

cabinet, a translucent sink deck, a doorway liner, a stow bin latch handle, and a lighted phone.

Evidence Appendix (37 C.F.R. 41.37 (c) (1) (ix))

No evidence pursuant to §§ 1.130, 1.131 or 1.132 of 37 C.F.R. or evidence entered by the Examiner and relied on by the applicant is present.

Related Proceedings Appendix (37 C.F.R. 41.37 (c) (1) (x))

There are no related appeals and interferences.

Summary

The cited references when taken alone or in combination do not teach or suggest the claimed invention. It is thus respectfully requested that the Examiner's rejection of claims be reversed.

Waiver of Oral Hearing

Applicants will rely on their Brief on Appeal and waive their right to present oral arguments at a hearing.

Respectfully Submitted,
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